Abstract of the Invention

The present invention provides a system and method for detecting and repairing defects in semiconductor devices. According to the invention, defects are located using a scanning probe microscope, such as an atomic force microscope or a scanning tunneling microscope, and repaired at locations determined by the scanning probe microscope. The microscope itself, and in particular the detection tip, may be employed to remove the defects. For example, the tip may be used to machine away the defect, to apply an electric field to oxidize the defect, and/or to heat the defect causing it to burn or vaporize. By combining precise defect location capabilities of a scanning probe microscope with defect removal, the invention permits very precise correction of defects such as excess material and foreign particles on semiconductor substrates.